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[0001]                   ADJUSTABLE BED RAIL

[0002]                   CROSS REFERENCE TO RELATED APPLICATION(S)

[0003]       This application claims priority from provisional application Serial No. 60/440,006 filed on January 14, 2003, which is incorporated by reference as if fully set forth.

[0004]                   FIELD OF INVENTION

[0005]       The present invention relates to bed rails. More particularly the present invention relates to a bed rail assembly which is held to a child's bed in a manner so as to prevent dislodgement thereof.

[0006]                   BACKGROUND

[0007]       Bed rails are typically utilized to protect children, elders, or injured persons from falling off a bed. The current technology of bed rails is quite basic in that most bed rails have either metal or plastic parts which protrude from the bed rail and are placed under the mattress and typically between the mattress and bedspring or between the mattress and other support. Traditional bed rails rely upon the friction between the mattress and the box spring to keep the bedrail in place. Quite often this is insufficient to retain the bed rail in place on the bed. It is therefore extremely advantageous to provide a bed rail which substantially avoids if not eliminates the danger of a bed rail slipping away from its intended position and use.

[0008]                   SUMMARY

[0009]       An adjustable bed rail capable of squeezing a mattress either alone or together with a bedspring to lock the protective side rail in place. The locking means

is adjustable to adjust for the height of the mattress either alone or together with the bedspring. Friction pads and/or surfaces mounted along surfaces of the bed rail engage the mattress to further enhance the locking of the side rail to the mattress. In one preferred embodiment the rail portion drops down when unlocked to facilitate climbing onto or off of the bed. The rail is adjustable in length to accommodate different bed lengths and different occupants.

[0010] BRIEF DESCRIPTION OF THE DRAWING(S)

[0011] The present invention will be understood from a consideration of the detailed description and drawings, wherein like elements are designated by like numerals and, wherein:

[0012] Figure 1 is a perspective view showing a first embodiment of a bed rail designed in accordance with the principles of the present invention.

[0013] Figure 2 is a perspective view of a latch assembly employed in the bed rail of Figure 1.

[0014] Figure 3 is a sectional view of the latch assembly looking in the direction of arrows 3-3' of Figure 2.

[0015] Figure 4 is a detailed, partially sectionalized view looking in the direction of arrows 4-4 of Figure 2, of one embodiment of a latch assembly for adjusting the height of the bed rail to firmly grip the mattress.

[0016] Figure 5 is a perspective view of the presently preferred embodiment of the present invention.

[0017] Figures 6-8 are perspective views showing different views of the embodiment of Figure 5 to facilitate an understanding of various aspects of the invention.

[0018] Figures 9 and 10 are sectional views of Figure 7 through the line 9/10-9/10 showing the portion in two different positions.

[0019] Figure 11 is a perspective view of an alternative embodiment of the

present invention.

[0020] DETAILED DESCRIPTION OF PREFERRED EMBODIMENT(S)

[0021] Figure 1 shows a bed rail assembly 10 embodying the principles of the present invention, the upper rail portion protecting a person, i.e., an adult or a child, from falling off the bed and is comprised of two horizontal bars or tubes 11 and 12. Upper bar 11 is curved at 11a and 11b to form vertically aligned portions 11c and 11d. Tubular member 12 has its ends secured to the vertical portions 11c, 11d of member 11. If desired, additional horizontal bars may be placed above and/or below member 12. Also, the length (i.e. "height") of portions height 11c and 11d and the lengths of the bars 11 and 12 may be increased if desired without departing from the scope and spirit of the present invention. Members 11 and 12 are preferably formed of a suitable light-weight material such as tubular steel or aluminum or a suitable plastic. If desired, the members 11 and 12 may also be formed of wood or other solid material which is preferably light-weight and yet sturdy. Bar 11 also bends outwardly at 11e and 11f and extends into assemblies 13 and 14, respectively.

[0022] Each of the assemblies 13 and 14 has a pair of elongated, bifurcated arms 13a, 13b and 14a, 14b secured to the lower ends thereof. In addition thereto, each of the assemblies 13 and 14 has a movable, lockable end 16, 17, which is vertically aligned, each receiving one of the vertical arms 16a, 17a. These lockable arms 16a and 17a may be hollow or solid.

[0023] Figure 2 is an enlarged view of the mattress holding portion of the bedrail of Figure 1. Figure 3 is a sectional view of Figure 2 looking in the direction of arrows 3-3' and Figure 4 is partially sectionized view of the structure of Figure 2 looking in the directions of arrows 4-4' and further showing brackets B1 pivotally mounting locking arm 15 by means of a pivot pin P, only one assembly being described for purposes of simplicity. Hollow tubular member 16 has an opening 16b for receiving

a projection 15a of the locking arm 15. As locking arm 15 is moved to dotted line position 15', the forward tip T of projection 15a moves away from opening 16b, enabling the arm 16a to be moved relative to tubular portion 16 to adjust to the height of a mattress M.

[0024] The arm 16a is positioned relative to tubular member 16 preferably so as to "squeeze" mattress M between the horizontal member 13c and bifurcated arms 13a, 13b. When the mattress M is adequately "squeezed," locking arm 15 is moved to the dotted line position 15". In this position, projection 15a enters into opening 16b and tip 15b of projection 15a thereof presses against an adjacent side of arm 16a. The tip 15b assumes an over-center position relative to center line CL. This over-center position is retained by the lower edge of the locking arm 15 to lock the arm 16a within hollow tubular member 16.

[0025] The assembly 14 operates in a substantially identical manner.

[0026] In order to further enhance the holding force applied to the mattress by the bed rail assembly 10, friction pads (not shown) may be placed on the underside 13d, 14d of horizontal members 13c, 14c and/or on the upper surface of arms 13a, 13b and 14a, 14b.

[0027] Figures 5-11 show a presently preferred embodiment 20 of the present invention which is comprised of a rail portion 22 and a supporting portion 24. The rail portion 22 is generally comprised of a pair of side posts 25, 26 and upper and lower cross pieces 27 and 28 coupled to the side posts at each corner thereof.

[0028] The supporting portion 24 is comprised of a pair of base members 33 and 34 which are substantially identical in design and function to one another and only one of these base members will be described herein for purposes of simplicity. The base member 33 has a portion 33a at its inner end extending into a hollow L-shaped bracket 35. Fastening member 36 extends therethrough to hold base member 33 pivotably in place. The opposite end 33b of base member 33 is of increased width and

has an upper surface 33c provided with a V-shaped or sawtooth configuration to facilitate providing a firm grip upon a mattress.

[0029] The free-end of base member 33 is tapered as shown at 33d to facilitate sliding of the base member beneath a mattress and typically between a mattress and a boxspring. A rugged, flexible fabric or plastic web 37 extends through an elongated slot 33e provided in the end having a sloping surface 33d. Web 37 is provided with a locking element 64 for snap-fitting within a cooperating locking element 65 coupled to one end of a web 62, the opposite end of which is coupled to a preferably flat plate 63 which may be placed against a sidewall of the mattress opposite the sidewall along which the rail is mounted to provide additional means for holding the side rail in place. Alternatively, as is shown in Figure 11, a Y shaped web 70 may be coupled at one end to base members 33, 34 and at the apex 70a to a web 71 provided with a locking member 64' similar to locking member 64. A web 72 is threaded through plate 63' at an end and is coupled to a locking member 65' similar to locking member 65 for releasably locking with locking member 64.

[0030] L-shaped bracket 35 (and its mirror image 55) is hollow and has a substantially rectangular-shaped cross-section. The upper end 35a telescopingly receives an elongated arm 38 whose upper end extends into a hollow opening a second L-shaped bracket 39, the upper end of member 38 being provided with an opening (not shown) that cooperates with openings on opposite sides of member 39 for receiving fastener 40 to secure members 38 and 39 to one another.

[0031] Member 38 (and its mirror image 58) is also preferably hollow (as shown in Figure 9), and has a rectangular-shaped cross-section similar to that of the upper end 35a of L-shaped bracket 35. Member 38 is slideable within bracket 35. One side surface of member 38 is provided with a plurality of step openings 38a. Bracket 35 is provided with a spring loaded locking knob 41 in which an internal bias spring (not shown) normally causes the locking knob 41 to be urged inwardly into bracket 35 in the direction shown by arrow A. Although not shown, the opposite end of

locking knob 41 is provided with a tip that mates with and engages an associated one of the openings 38a. By lifting or lowering member 38, one of the openings 38a may be selected to be aligned with the locking knob 41 which is normally pulled out to permit the member 38 to freely slide with bracket 35. When the member 38 reaches the desired position, locking knob 41 is released, causing its tip to enter one of the openings 38a and thereby lock the supporting structure in a selected position.

[0032] The arm portion 39a of L-shaped bracket 39 (and its mirror image 59), is provided with openings on opposite sides thereof which cooperate with openings on opposite sides of a projecting portion 30a of corner bracket 30. The fastening member 42 extends through the openings in projecting portion 30a as well as through the opposite sidewalls of bracket portion 39a of L-shaped bracket 39 to pivotally couple these members together.

[0033] The projecting portion 30a has a locking/release button 44 shown in Figures 6, 9, and 10. When the rail portion 22 is in the upright position as shown in Figures 5 and 7, a locking button 50 that is spring loaded by internal spring bias means 51 (both shown in Figures 9 and 10) locks arms 39a and 30a in the upright position by engaging hole 52 in arm 30a. In order to facilitate climbing onto and off of the bed, buttons 44 (on both supporting portions) are pressed in to remove button 50 from the opening 52 in corner bracket 30 to enable rail portion 22 to freely pivot about pivot pin 41, enabling the rail portion to pivot in the counterclockwise direction shown by arrow C in Figure 5 so as to move the rail portion to a downward position whereby the sides 25 and 26 are substantially aligned with the slideable members 38. In this lowered position, the button 44, which is biased downward by an internal bias spring 45, engaged an angled holding hole 47 that holds the rail in the lowered position. The button 44 can be released from this holding hole 47, allowing the rail portion to be raised by pivoting the rail assembly about pivot members 41. When the rail assembly reaches the upright position, the locking button 50 automatically locks into position through hole 52 by pressing the button

44 back through hole 52. As can be understood, the force exerted by spring 51 attached to the button 50 is greater than that exerted by spring 45 attached to button 44.

[0034] As is best shown in Figure 5, a lightweight and yet rugged netting 61 is placed across the opening in the rail frame formed by members 25, 26, 27 and 28. The netting 61 may be provided with upper and lower sleeves 61a, 61b which receive the upper and lower crosspieces 27 and 28, the netting being placed upon members 27 and 28 before assembly of the rail portion.

[0035] The netting 61 is also provided with side sleeves 61c, 61d for slideably receiving the side frames 25 and 26. The netting may also be provided with a storage pocket 61e, open at its upper end and having a stretchable edge 61f for storage, for example, of bed clothing or any other items which a user may desire to place in the pocket.

[0036] The upper and lower members 27 and 28 are preferably comprised of a pair of tubular members 27, 27a and 28, 28a. Members 27 and 28 telescope into members 27a, 28a to adjust the length of the frame. If desired, the frame members 25, 26 may be similar in design to adjust the height of the rail.

[0037] The bed rail is mounted to a bed by placing the base members 33 and 34 beneath a mattress and moving the base members further beneath the mattress until the upright portions of L-shaped brackets 35 and 55 are either in engagement with or nearly in engagement with an adjacent sidewall of the mattress. Each of the locking buttons such as locking button 41 is released, enabling each of the slideable members such as slideable member 38 to be moved downwardly until the mattress is firmly gripped between the undersurface of bracket portion 39a and the base member 33. The locking member 41 is released whereby the pin-shaped free end of the locking member enters one of the openings 38a to hold the assembly in the desired position preferably at least slightly squeezing the mattress between the undersurface of arm 39a and base member 33.

[0038] Figure 7 shows a view of the underside of arm 39a of L-shaped bracket 39 as being provided with a pad 57 having a saw-tooth like pattern of V-shaped grooves, further cooperating with base member 33 and the V-shaped grooves, provided therealong to firmly grip the mattress therebetween.

[0039] In the event that further holding forces are desired, the fastener 38 coupled to the free end of web 37 may be snapped-fitted into a cooperating locking member coupled to one end of the second elongated web 62 whose opposite end is coupled to an elongated plate 63 which may be positioned to engage a sidewall of the mattress M on the opposite side of the mattress from that along which the rail is mounted. The lower end of member 63 engages a sidewall of the box spring BS, thereby holding the bed rail assembly in place. Either web 37 or web 62 or both, are adjustable to adjust the distance between L-shaped bracket 35, engaging one sidewall of the mattress and member 63 engaging the opposite side wall of the mattress. Base member 34 may be provided with a similar structure.

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